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(54) Title: LARGE DIAMETER OPTICAL WAVEGUIDE, GRATING, AND LASER

(57) Abstract: A large diameter optical waveguide, grating, and laser includes a waveguide (10) having at least one core surrounded by a cladding, the core propagating light in substantially a few transverse spatial modes; and having an outer waveguide dimension of said waveguide being greater than about 0.3mm. The waveguide may be axially compressed which causes the length of the waveguide to decrease without buckling. The waveguide may be used for any application where a waveguide needs to be compression tuned, e.g., compression-tuned fiber Bragg gratings and lasers or other applications. Also, the waveguide exhibits lower mode coupling from the core to the cladding and allows for higher optical power to be used when writing gratings without damaging the waveguide. The shape of the waveguide may have other geometries (e.g., a "dogbone" shape) and/or more than one grating or pair of gratings may be used and more than one core may be used. The core and/or cladding may be doped with a rare-earth dopant and/or may be photosensitive. At least a portion of the core may be doped between a pair of gratings to form a fiber laser. Also a tunable DFB fiber laser or an interactive fiber laser can be constructed within the waveguide. The waveguide may resemble a short "block" or a longer "cane" type, depending on the application and dimensions used.

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# INTERNATIONAL SEARCH REPORT

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G02B6/12 G02B6/16 H01S3/067

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G02B H01S

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC, PAJ, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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